

NMCP COVID-19 Literature Report #52: Friday, 18 December 2020

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Purpose: These weekly reports, published on Fridays, are curated collections of current research, evidence reviews, special reports, grey literature, and news regarding the COVID-19 pandemic that may be of interest to medical providers and leadership. All reports are available online at <https://nmcp.libguides.com/covidreport>. Access is private; you will need to use the direct link or bookmark the URL, along with the case-sensitive password "NMCPfinest".

Disclaimer: I am not a medical professional. This document is current as of the date noted above. While I make every effort to find and summarize available data, things are changing rapidly, with new research and potentially conflicting literature published daily. Please feel free to reach out with questions, suggestions for future topics, or any other feedback.

Statistics

Global today: 75,179,482 confirmed cases and 1,667,124 deaths in 191 countries/regions

1 week ago: 69,765,806 confirmed cases and 1,585,221 deaths in 191 countries/regions

2 weeks ago: 65,408,787 confirmed cases and 1,509,743 deaths in 191 countries/regions

United States*

top 5 states by cases (Virginia is ranked 21st)

	TOTAL US	CA	TX	FL	IL	NY
Cases	17,243,580	1,760,506	1,551,792	1,168,483	879,428	815,469
Tests	224,523,929	28,456,358	12,444,012	14,262,140	12,147,303	22,680,046
Deaths	292,196	22,193	25,184	20,305	15,985	36,052

*see census.gov for current US Population data; NA: not all data available

[JHU CSSE](https://jhu.csse.as.edu) as of 1000 EDT 18 December 2020

Virginia	Total (state)	Chesapeake	Hampton	Newport News	Norfolk	Portsmouth	Suffolk	Virginia Beach
Cases	299,388	8,168	3,678	4,996	7,684	3,760	3,379	13,840
Hospitalizations	16,684	581	178	184	525	398	212	667
Deaths	4,598	92	43	63	101	74	87	132

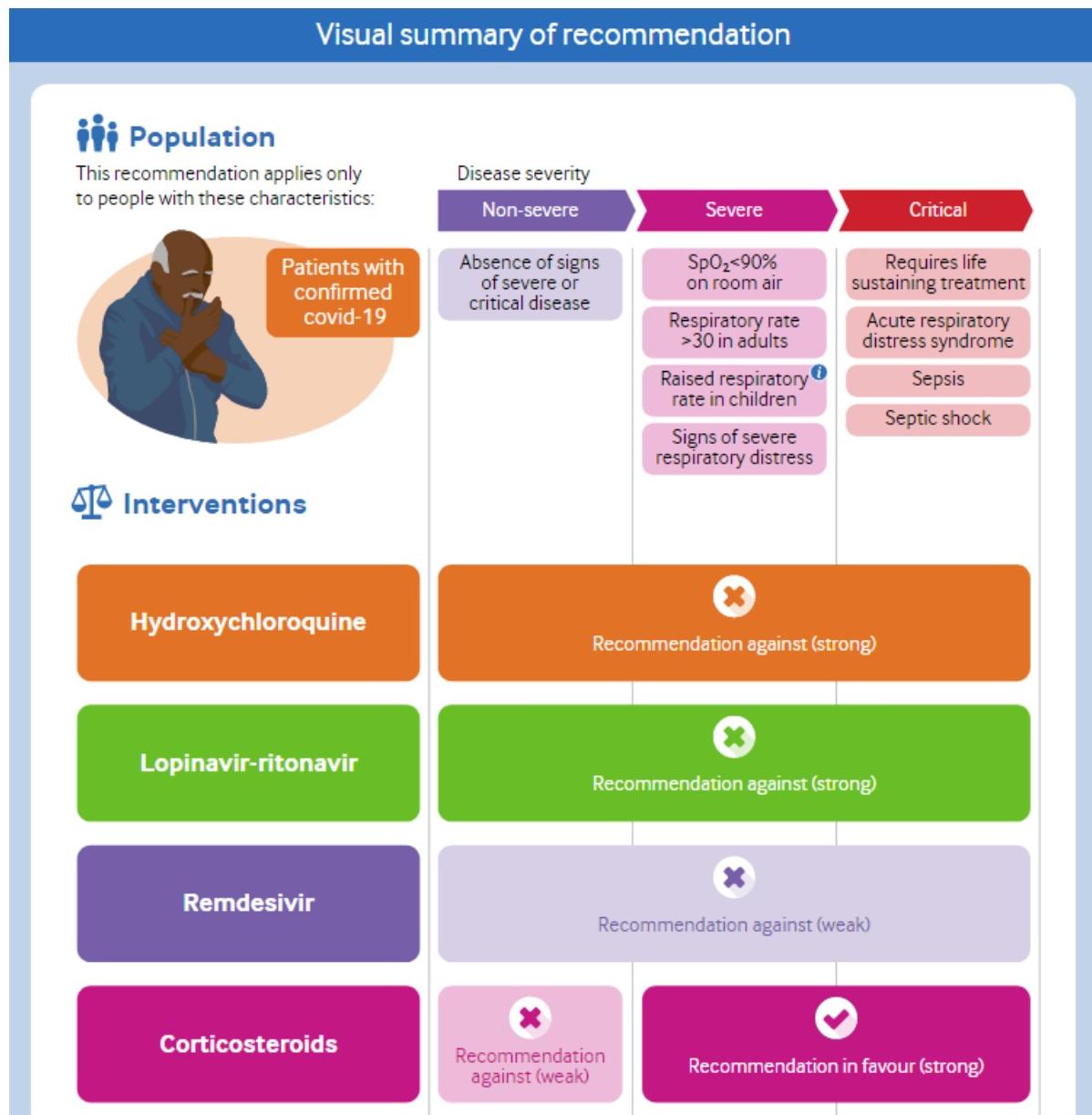
[VA DOH](https://vadoph.virginia.gov) as of 1000 EDT 18 December 2020

The Latest News on COVID-19 Vaccines

A week after meeting to discuss the COVID-19 vaccine from Pfizer/BioNTech, the FDA's Vaccines and Related Biological Products Advisory Committee (VRBPAC) met to discuss the new coronavirus vaccine from Moderna and endorse it for an Emergency Use Authorization ([NPR](#); see [the FDA briefing document \[pdf\]](#) for full data). The EUA is expected on Friday ([STAT](#)).

Other Things of Interest and Special Reports

BMJ: [Update to living WHO guideline on drugs for covid-19](#) (updated 17 December 2020)



NIH: [The COVID-19 Treatment Guidelines Panel's Statement on the Emergency Use Authorization of Baricitinib for the Treatment of COVID-19](#) (updated 14 December 2020)

"After reviewing the available evidence for baricitinib, the Panel has determined the following:

- There are insufficient data for the Panel to recommend either for or against the use of baricitinib in combination with remdesivir for the treatment of COVID-19 in hospitalized patients in cases where corticosteroids can be used instead.
- In the rare circumstances where corticosteroids cannot be used, the Panel recommends using baricitinib in combination with remdesivir for the treatment of COVID-19 in hospitalized, nonintubated patients who require oxygen supplementation (BIIa).
- The Panel **recommends against** the use of baricitinib in the absence of remdesivir, except in a clinical trial (AIII).
- There are insufficient data for the Panel to recommend either for or against the use of baricitinib in combination with corticosteroids for the treatment of COVID-19. Since both agents are potent immunosuppressants, there is potential for an additive risk of infection.
- More data are needed to clarify the role of baricitinib in the management of COVID-19, especially data from randomized trials that compare the use of baricitinib with the current standard of care and evaluate which subpopulations benefit the most from baricitinib. Health care providers are encouraged to discuss participation in baricitinib clinical trials with their patients."

Selected Literature: Peer-Reviewed Journals

Date given is the date published or posted online; often these papers are ahead of print.

18 December 2020

MMWR: [Health Center Testing for SARS-CoV-2 During the COVID-19 Pandemic — United States, June 5–October 2, 2020](#)

"Long-standing social inequities and health disparities have resulted in increased risk for COVID-19 infection, severe illness, and death among racial and ethnic minority populations.

Health centers have provided racial and ethnic minority populations access to SARS-CoV-2 testing. Improving health centers' ability to reach groups at increased risk for COVID-19 might reduce transmission by identifying cases and supporting contact tracing and isolation.

Efforts to improve coordination of COVID-19 response-related activities between state and local public health departments and HRSA-funded health centers can increase access to testing and follow-up care for populations at increased risk for COVID-19."

MMWR: [Telehealth Practice Among Health Centers During the COVID-19 Pandemic — United States, July 11–17, 2020](#)

"Limited data are available on expansion of virtual health care visits (telehealth) among U.S. health centers during the COVID-19 pandemic.

During July 11–17, 2020, 963 (95.4%) of 1,009 Health Resources and Services Administration–funded health centers that responded to a voluntary weekly survey reported providing telehealth services. Health centers in urban areas were more likely to provide >30% of visits virtually than were those in rural areas.

Telehealth is a promising approach to promoting and expanding access to care, especially in the South and rural areas; this cost-effective modality can facilitate public health mitigation strategies and prevent transmission of SARS-CoV-2 and other respiratory illnesses, while supporting continuity of care."

17 December 2020

JAMA Otolaryngol Head Neck Surg: [Early Outcomes From Early Tracheostomy for Patients With COVID-19](#)

"Question: Is early tracheostomy associated with improved outcomes for patients with coronavirus disease 2019 (COVID-19) requiring mechanical ventilation?

Findings: In this cohort study of 148 patients with COVID-19, timing of tracheostomy was significantly associated with length of stay; median length of stay was 40 days in those who underwent early tracheostomy and 49 days in those who underwent late tracheostomy.

Meaning: In patients with COVID-19, early tracheostomy was noninferior to late tracheostomy and may be associated with improvement in some outcomes; it did not contribute to increased infections of clinicians."

Lancet Digital Health: [Renin–angiotensin system blockers and susceptibility to COVID-19: an international, open science, cohort analysis](#)

"This study comprehensively evaluates the safety of ACEIs and ARBs in COVID-19 by examining a large number of different comparisons using state-of-the-art methods to control for residual confounding and bias across a distributed network. Our study shows similar results across three databases from two countries. ACEI and ARB use does not confer increased risk of: COVID-19 diagnosis; hospital admission with COVID-19; hospital admission

with pneumonia; or hospital admission with pneumonia, acute respiratory distress syndrome, acute kidney injury, or sepsis compared with people taking calcium channel blockers and thiazide or thiazide-like diuretics.

Use of ACEIs and ARBs does not affect COVID-19 susceptibility risk, and these results are in keeping with medicines regulatory and clinical society recommendations that patients should not alter their treatment with these medicines to reduce their COVID-19 risk.

Several studies have emerged examining this conundrum. Although informative, they have had small sample sizes, limited confounder adjustment, used heterogeneous comparisons, or had methodological limitations, including immortal time bias and collider bias.^{18, 19, 20, 21} For example, comparing the risk of COVID-19 among users of ACEIs or ARBs with an unexposed control population can result in recruitment of non-comparable participants, confounding by indication, and the absence of a clear index date for when follow-up should start, all of which can induce bias. Reliable evidence should also be replicable, generalisable, and robust. To draw strong conclusions from observational studies, it is essential that consistent findings are produced from transparent, well designed analyses across multiple populations and data capture processes to ensure that any associations are not due to systematic error or applicable only in narrow contexts. We aimed to determine whether exposure to ACEIs or ARBs is associated with an increased susceptibility to COVID-19 among patients with hypertension."

Lancet Respir Med: Comparison of the characteristics, morbidity, and mortality of COVID-19 and seasonal influenza: a nationwide, population-based retrospective cohort study

"This study provides novel information about hospitalised patients with COVID-19. Our analysis uses a large national database including more than 89 000 patients with COVID-19 and more than 45 000 patients with seasonal influenza, including patients of all ages. We identified excess mortality associated with COVID-19 relative to seasonal influenza, with an age-standardised mortality ratio of 2·8. We evaluated differences between the characteristics of the two epidemics by age group, and more specifically in children aged 0–5 years (around 600 patients with COVID-19 and 7000 with influenza) and 6–17 years (around 600 patients with COVID-19 and 2000 with influenza).

In-hospital case mortality was found to be higher in younger patients with COVID-19 compared with younger patients with influenza, even though children were at a lower risk of hospitalisation for COVID-19 than for influenza (as observed in our study and previously). However, the findings relating to deaths in children with COVID-19 are based on small numbers and should be treated with caution. More generally, the severe forms of COVID-19 and seasonal influenza requiring hospitalisation differ considerably. This underlines the need for additional studies to better characterise and understand the role and relative importance of risk factors associated with COVID-19 mortality, such as obesity, particularly

in adolescents. This study also reinforces the importance of preventive and curative measures against both diseases. These data are particularly relevant as the epidemic continues to grow around the world and several countries prepare for potential overlapping of the seasonal influenza and COVID-19 epidemics."

16 December 2020

Emerg Infect Dis: [SARS-CoV-2 Infections among Recent Organ Recipients, March–May 2020, United States](#)

"We conducted public health investigations of 8 organ transplant recipients who tested positive for severe acute respiratory syndrome coronavirus 2 infection. Findings suggest the most likely source of transmission was community or healthcare exposure, not the organ donor. Transplant centers should educate transplant candidates and recipients about infection prevention recommendations."

Emerg Infect Dis: [Postmortem Stability of SARS-CoV-2 in Nasopharyngeal Mucosa](#)

"Analyses of infection chains have demonstrated that severe acute respiratory syndrome coronavirus 2 is highly transmissible. However, data on postmortem stability and infectivity are lacking. Our finding of nasopharyngeal viral RNA stability in 79 corpses showed no time-dependent decrease. Maintained infectivity is supported by virus isolation up to 35 hours postmortem."

JAMA: [All-Cause Excess Mortality and COVID-19-Related Mortality Among US Adults Aged 25-44 Years, March-July 2020](#)

"This study compares all-cause excess mortality and COVID-19-related mortality during the early pandemic period (March-July 2020) with unintentional drug overdoses, the usual leading cause of death in young adults, during the same period in 2018 among adults aged 25 to 44 years."

15 December 2020

BMJ: [Comparative evaluation of clinical manifestations and risk of death in patients admitted to hospital with covid-19 and seasonal influenza: cohort study](#)

"Objective To comparatively examine differences in risk of clinical manifestations and death among people admitted to hospital with coronavirus disease 2019 (covid-19) and seasonal influenza.

Design Cohort study.

US Department of Veterans Affairs.

Participants Patients admitted to hospital with covid-19 between 1 February 2020 and 17 June 2020 (n=3641) and seasonal influenza between 2017 and 2019 (n=12 676).

Main outcome measures Risks of clinical manifestations, healthcare resource use (including use of mechanical ventilation, admission to intensive care, and length of stay), and death, estimated using a doubly robust approach to build propensity scores that were then used along with covariates to adjust the outcome models.

Results Compared with seasonal influenza, covid-19 was associated with higher risk of acute kidney injury (odds ratio 1.52, 95% confidence interval 1.37 to 1.69), incident renal replacement therapy (4.11, 3.13 to 5.40), incident insulin use (1.86, 1.62 to 2.14), severe septic shock (4.04, 3.38 to 4.83), vasopressor use (3.95, 3.46 to 4.51), pulmonary embolism (1.50, 1.18 to 1.90), deep venous thrombosis (1.50, 1.20 to 1.88), stroke (1.62, 1.17 to 2.24), acute myocarditis (7.82, 3.53 to 17.36), arrhythmias and sudden cardiac death (1.76, 1.40 to 2.20), elevated troponin (1.75, 1.50 to 2.05), elevated aspartate aminotransferase (3.16, 2.91 to 3.43), elevated alanine aminotransferase (2.65, 2.43 to 2.88), and rhabdomyolysis (1.84, 1.54 to 2.18). Compared with seasonal influenza, covid-19 was also associated with higher risk of death, mechanical ventilator use, and admission to intensive care (hazard ratio 4.97, (95% confidence interval 4.42 to 5.58), 4.01 (3.53 to 4.54), and 2.41 (2.25 to 2.59), respectively) and 3.00 (2.20 to 3.80) additional days of hospital stay. Differences in rates of death per 100 patients between covid-19 and seasonal influenza were most pronounced in people over 75 years of age with chronic kidney disease or dementia and those with black race and obesity, diabetes, or chronic kidney disease.

Conclusions Among people admitted to hospital, compared with seasonal influenza, covid-19 was associated with increased risk of extrapulmonary organ dysfunction, death, and increased health resource use. The findings may inform the global discussion about the comparative risks of covid-19 and seasonal influenza and may help the ongoing effort to manage the covid-19 global pandemic."

[JAMA: Changes in Outpatient Buprenorphine Dispensing During the COVID-19 Pandemic](#)

"This study examined outpatient buprenorphine dispensing patterns in Texas before vs after the Drug Enforcement Administration temporarily relaxed outpatient buprenorphine prescribing regulations in March 2020 in response to the COVID-19 pandemic."

[Lancet Child Adolesc Health: Neuroimaging manifestations in children with SARS-CoV-2 infection: a multinational, multicentre collaborative study](#)

"This study has allowed the systematic evaluation of neuroimaging manifestations in the largest reported cohort of children infected with SARS-CoV-2 to date, and includes children with acute COVID-19 and those in the postinfectious period. Recurring patterns of disease

were identified, along with more unusual imaging manifestations that we were able to recognise due to the large number of cases evaluated simultaneously. The neuroimaging manifestations of COVID-19 infection in children can range from mild to fatal, and pre-existing conditions were usually absent. Cerebrovascular complications seem to be less common in children than in adults. The most common imaging findings observed in children resembled immune-mediated parainfectious patterns of disease involving the brain, spine, and nerves. An important observation was that cranial nerve enhancement did not always correlate with cranial nerve deficits. The dominant findings in multisystem inflammatory syndrome in children were splenial lesions and myositis of the face and neck. This study also describes the development of fatal atypical CNS infections in previously healthy children infected with SARS-CoV-2.

Acute-phase and delayed-phase SARS-CoV-2-related changes in the CNS in children were identified in this large case study. Different recognisable patterns of brain, cranial nerve, and spinal cord involvement were identified, including multifocal T2 bright lesions in brain white matter, vasculitic patterns with ischaemic lesions, enhancing neuritis or polyradiculitis, venous thrombosis, splenial lesions of the corpus callosum, longitudinally extensive myelitis, and myositis. These findings should be recognised and investigated for possible SARS-CoV-2 infection as the underlying aetiological factor. COVID-19 CNS disease in children, although less frequent than in adults, can occur, with severe CNS involvement in previously healthy, typically developing children. Studies of paediatric-specific cohorts are needed to better understand the effects of SARS-CoV-2 infection on the CNS at presentation and on long-term follow-up in children."

MMWR: [Factors Associated with Positive SARS-CoV-2 Test Results in Outpatient Health Facilities and Emergency Departments Among Children and Adolescents Aged <18 Years — Mississippi, September–November 2020](#)

"Community and close contact exposures contribute to the spread of COVID-19.

Among children and adolescents aged <18 years in Mississippi, close contact with persons with COVID-19 and gatherings with persons outside the household and lack of consistent mask use in school were associated with SARS-CoV-2 infection, whereas attending school or child care was not associated with receiving positive SARS-CoV-2 test results.

Close contacts with persons with COVID-19 and gatherings contribute to SARS-CoV-2 infections in children and adolescents. Consistent use of face masks and social distancing continue to be important to prevent COVID-19 spread."

14 December 2020

Brain: [Epidemiological and cohort study finds no association between COVID-19 and Guillain-Barré syndrome](#)

"Reports of Guillain-Barré syndrome (GBS) have emerged during the Coronavirus disease 2019 (COVID-19) pandemic. This epidemiological and cohort study sought to investigate any causative association between COVID-19 infection and GBS. The epidemiology of GBS cases reported to the UK National Immunoglobulin Database was studied from 2016 to 2019 and compared to cases reported during the COVID-19 pandemic. Data were stratified by hospital trust and region, with numbers of reported cases per month. UK population data for COVID-19 infection were collated from UK public health bodies. In parallel, but separately, members of the British Peripheral Nerve Society prospectively reported incident cases of GBS during the pandemic at their hospitals to a central register. The clinical features, investigation findings and outcomes of COVID-19 (definite or probable) and non-COVID-19 associated GBS cases in his cohort were compared. The incidence of GBS treated in UK hospitals from 2016 to 2019 was 1.65–1.88 per 100 000 individuals per year. In 2020, GBS and COVID-19 incidences varied between regions and did not correlate with one another ($r = 0.06$, 95% confidence interval: -0.56 to 0.63, $P = 0.86$). GBS incidence fell between March and May 2020 compared to the same months of 2016–19. In an independent cohort study, 47 GBS cases were reported (COVID-19 status: 13 definite, 12 probable, 22 non-COVID-19). There were no significant differences in the pattern of weakness, time to nadir, neurophysiology, CSF findings or outcome between these groups. Intubation was more frequent in the COVID-19 affected cohort (7/13, 54% versus 5/22, 23% in COVID-19-negative) likely related to COVID-19 pulmonary involvement. Although it is not possible to entirely rule out the possibility of a link this study finds no epidemiological or phenotypic clues of SARS-CoV-2 being causative of GBS. GBS incidence has fallen during the pandemic, which may be the influence of lockdown measures reducing transmission of GBS inducing pathogens such as *Campylobacter jejuni* and respiratory viruses."

JAMA: [Readmission and Death After Initial Hospital Discharge Among Patients With COVID-19 in a Large Multihospital System](#)

"This study describes reasons for readmission, use of ICU interventions during readmission, and proportions of death after initial hospital discharge of COVID-19 patients from US Veterans Affairs (VA) hospitals March-June 2020."

JAMA Intern Med: [Association of Political Party Affiliation With Physical Distancing Among Young Adults During the COVID-19 Pandemic](#)

"This cross-sectional study estimates the association of political party affiliation with physical distancing behaviors among young adults during the coronavirus disease 2019 pandemic."

JAMA Netw Open: [Clinical Characteristics and Disease Severity Among Infants With SARS-CoV-2 Infection in Montreal, Quebec, Canada](#)

"This case series describes clinical characteristics and disease severity in infants who had SARS-CoV-2 infection in Montreal, Quebec, Canada."

JAMA Netw Open: [Household Transmission of SARS-CoV-2: A Systematic Review and Meta-analysis](#)

"Question: What is the household secondary attack rate for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)?

Findings: In this meta-analysis of 54 studies with 77 758 participants, the estimated overall household secondary attack rate was 16.6%, higher than observed secondary attack rates for SARS-CoV and Middle East respiratory syndrome coronavirus. Controlling for differences across studies, secondary attack rates were higher in households from symptomatic index cases than asymptomatic index cases, to adult contacts than to child contacts, to spouses than to other family contacts, and in households with 1 contact than households with 3 or more contacts.

Meaning: These findings suggest that households are and will continue to be important venues for transmission, even in areas where community transmission is reduced."

JAMA Netw Open: [Comparison of 2 Triage Scoring Guidelines for Allocation of Mechanical Ventilators](#)

"Question: What are the characteristics of intensive care unit admissions identified by 2 proposed pandemic ventilator allocation triage guidelines using Sequential Organ Failure Assessment scores when applied retrospectively to critically ill US patients who received mechanical ventilation?

Findings: In this cohort study of 40 439 admissions to intensive care units that received mechanical ventilation, the New York State guideline identified 9% who would likely meet criteria for the lowest priority for ventilator allocation compared with 4% from the original White and Lo guideline. Only 655 admissions (1.6%) were in the lowest priority category for both guidelines, with 39% survival to hospital discharge for admissions identified as lowest priority using the New York State guideline compared with 56% for admissions identified using White and Lo.

Meaning: Two distinct approaches to triage for mechanical ventilation showed little agreement, suggesting that further clinical assessment of different potential criteria for triage decisions is important to ensure equitable allocation of resources."

11 December 2020

MMWR: [Summary of Guidance for Public Health Strategies to Address High Levels of Community Transmission of SARS-CoV-2 and Related Deaths, December 2020](#)

"The United States is experiencing high levels of SARS-CoV-2 transmission.

COVID-19 pandemic control requires a multipronged application of evidence-based strategies while improving health equity: universal face mask use, physical distancing, avoiding nonessential indoor spaces, increasing testing, prompt quarantine of exposed persons, safeguarding those at increased risk for severe illness or death, protecting essential workers, postponing travel, enhancing ventilation and hand hygiene, and achieving widespread COVID-19 vaccination coverage.

These combined strategies will protect health care, essential businesses, and schools, bridging to a future with high community coverage of effective vaccines and safe return to more activities in a range of settings."

Nature: [Genetic mechanisms of critical illness in Covid-19](#)

"Host-mediated lung inflammation is present, and drives mortality, in critical illness caused by Covid-19. Host genetic variants associated with critical illness may identify mechanistic targets for therapeutic development.³ Here we report the results of the GenOMICC (Genetics Of Mortality In Critical Care) genome-wide association study (GWAS) in 2244 critically ill Covid-19 patients from 208 UK intensive care units (ICUs). We identify and replicate novel genome-wide significant associations, on chr12q24.13 (rs10735079, p=1.65 × 10⁻⁸) in a gene cluster encoding antiviral restriction enzyme activators (OAS1, OAS2, OAS3), on chr19p13.2 (rs2109069, p=2.3 × 10⁻¹²) near the gene encoding tyrosine kinase 2 (TYK2), on chr19p13.3 (rs2109069, p=3.98 × 10⁻¹²) within the gene encoding dipeptidyl peptidase 9 (DPP9), and on chr21q22.1 (rs2236757, p=4.99 × 10⁻⁸) in the interferon receptor gene IFNAR2. We identify potential targets for repurposing of licensed medications: using Mendelian randomisation we found evidence in support of a causal link from low expression of IFNAR2, and high expression of TYK2, to life-threatening disease; transcriptome-wide association in lung tissue revealed that high expression of the monocyte/macrophage chemotactic receptor CCR2 is associated with severe Covid-19. Our results identify robust genetic signals relating to key host antiviral defence mechanisms, and mediators of inflammatory organ damage in Covid-19. Both mechanisms may be amenable to targeted treatment with existing drugs. Large-scale randomised clinical trials will be essential before any change to clinical practice."

NEJM: [Baricitinib plus Remdesivir for Hospitalized Adults with Covid-19](#)

"We conducted a double-blind, randomized, placebo-controlled trial evaluating baricitinib plus remdesivir in hospitalized adults with Covid-19. All the patients received remdesivir

(≤10 days) and either baricitinib (≤14 days) or placebo (control). The primary outcome was the time to recovery. The key secondary outcome was clinical status at day 15.

A total of 1033 patients underwent randomization (with 515 assigned to combination treatment and 518 to control). Patients receiving baricitinib had a median time to recovery of 7 days (95% confidence interval [CI], 6 to 8), as compared with 8 days (95% CI, 7 to 9) with control (rate ratio for recovery, 1.16; 95% CI, 1.01 to 1.32; P=0.03), and a 30% higher odds of improvement in clinical status at day 15 (odds ratio, 1.3; 95% CI, 1.0 to 1.6). Patients receiving high-flow oxygen or noninvasive ventilation at enrollment had a time to recovery of 10 days with combination treatment and 18 days with control (rate ratio for recovery, 1.51; 95% CI, 1.10 to 2.08). The 28-day mortality was 5.1% in the combination group and 7.8% in the control group (hazard ratio for death, 0.65; 95% CI, 0.39 to 1.09). Serious adverse events were less frequent in the combination group than in the control group (16.0% vs. 21.0%; difference, -5.0 percentage points; 95% CI, -9.8 to -0.3; P=0.03), as were new infections (5.9% vs. 11.2%; difference, -5.3 percentage points; 95% CI, -8.7 to -1.9; P=0.003).

Baricitinib plus remdesivir was superior to remdesivir alone in reducing recovery time and accelerating improvement in clinical status among patients with Covid-19, notably among those receiving high-flow oxygen or noninvasive ventilation. The combination was associated with fewer serious adverse events."

Selected Literature: Preprints

Preprints are found on preprint servers such as [arXiv](#), [bioRxiv](#), and [medRxiv](#); they are commonly used for biomedical research. Preprints may later be published in peer-reviewed journals. Per medRxiv: "Preprints are preliminary reports of work that have not been certified by peer review. They should not be relied on to guide clinical practice or health-related behavior and should not be reported in news media as established information."

bioRxiv: [SARS-CoV-2 RNA reverse-transcribed and integrated into the human genome](#) (posted 13 December 2020)

"Prolonged SARS-CoV-2 RNA shedding and recurrence of PCR-positive tests have been widely reported in patients after recovery, yet these patients most commonly are non-infectious. Here we investigated the possibility that SARS-CoV-2 RNAs can be reverse-transcribed and integrated into the human genome and that transcription of the integrated sequences might account for PCR-positive tests. In support of this hypothesis, we found chimeric transcripts consisting of viral fused to cellular sequences in published data sets of SARS-CoV-2 infected cultured cells and primary cells of patients, consistent with the

transcription of viral sequences integrated into the genome. To experimentally corroborate the possibility of viral retro-integration, we describe evidence that SARS-CoV-2 RNAs can be reverse transcribed in human cells by reverse transcriptase (RT) from LINE-1 elements or by HIV-1 RT, and that these DNA sequences can be integrated into the cell genome and subsequently be transcribed. Human endogenous LINE-1 expression was induced upon SARS-CoV-2 infection or by cytokine exposure in cultured cells, suggesting a molecular mechanism for SARS-CoV-2 retro-integration in patients. This novel feature of SARS-CoV-2 infection may explain why patients can continue to produce viral RNA after recovery and suggests a new aspect of RNA virus replication."

Events and Presentations

WHAT: CDC COCA: What Clinicians Need to Know About the Pfizer-BioNTech and Moderna COVID-19 Vaccines

WHEN: Friday, 18 December 2020 1400-1500 ET

DETAILS: "This COCA Call will give clinicians an overview of the Pfizer-BioNTech and Moderna COVID-19 vaccines. Clinicians will learn about vaccine characteristics and administration, vaccinating special populations, and contraindications. They will also get answers to a number of clinical questions CDC has received about these new vaccines."

See: https://emergency.cdc.gov/coca/calls/2020/callinfo_121820.asp

News in Brief

Daily coronavirus deaths have passed 3,600 as the US also hits a new record for hospitalizations on Thursday, 17 December 2020 ([NPR](#)).

BARDA hosts the [medicalcountermeasures.gov](#) website which covers information on COVID-19 vaccines and links to other resources of interest.

Other Vaccine News

"2 Alaska health care workers have allergic reactions after taking Pfizer's COVID-19 vaccine" ([CBS](#)).

OWS has purchased another 100 million doses of the Moderna COVID-19 vaccine ([HPN](#)).

States have different prioritizing and plans in place for COVID-19 vaccine distribution ([KFF](#)).

The European Medicines Agency (the EU's FDA) will convene next week to decide on the Pfizer COVID-19 vaccine ([Reuters](#)).

Older, non-coronavirus vaccines could help fight COVID-19 by revving up the immune response ([Medpage](#)).

Listen (35 mins): "On the Root Causes of Vaccine Hesitancy" ([CIGI](#)).

Treatment and Therapies

"RECOVERY trial finds no benefit from azithromycin in patients hospitalised with COVID-19" ([RECOVERY](#)).

Data from the phase 3 study of ruxolitinib on top of standard care for COVID-19 suggest it did not reduce severe complications ([Novartis](#)).

Exposure, Testing, and Risks

"How COVID-19 is changing the cold and flu season" ([Nature](#)).

A pharmaceutical meeting in February was an early superspreader event; now we have a better idea of just how many people were affected ([NYT](#); see [the Science article](#) for details).

Can your Apple Watch predict if you get COVID-19? Early evidence suggests that wearables could be useful at flagging potential infections before people are ill ([STAT](#)).

Pandemic Stressors

"Nearly 8 million Americans have fallen into poverty since the summer" ([WaPo](#)).

Social distancing isn't the only strain on relationships during the pandemic; sometimes you need to have challenging conversations about COVID-19 ([NPR](#)).

The pandemic set off 'cascade of problems' for people with eating disorders ([WaPo](#)).

A recent blog post offers 7 recommendations to address the growing mental health crisis, including universal mental health screenings and expanded virtual care ([Health Affairs](#)).

"Covid Christmas: Managing kids' expectations without turning into the Grinch" ([WaPo](#)).

Thanks, Coronavirus: Animal Edition

A snow leopard at the Louisville Zoo in Kentucky has a confirmed case of COVID-19; "it is suspected that they acquired the infection from an asymptomatic staff member, despite precautions taken by the zoo" ([USDA](#); photo courtesy of Louisville Zoo).

Meanwhile, the first case of COVID-19 in wild animals (detected as part of surveillance around infected farms) has been reported in a "free-ranging, wild mink" ([BBC](#)).

Long Reads

"How science beat the virus and what it lost in the process" ([Atlantic](#)).

"The coronavirus at 1: A year into the pandemic, what scientists know about how it spreads, infects, and sickens" ([STAT](#)).

"This is what it's like to be part of a COVID-19 vaccine trial" ([BuzzFeed](#)).

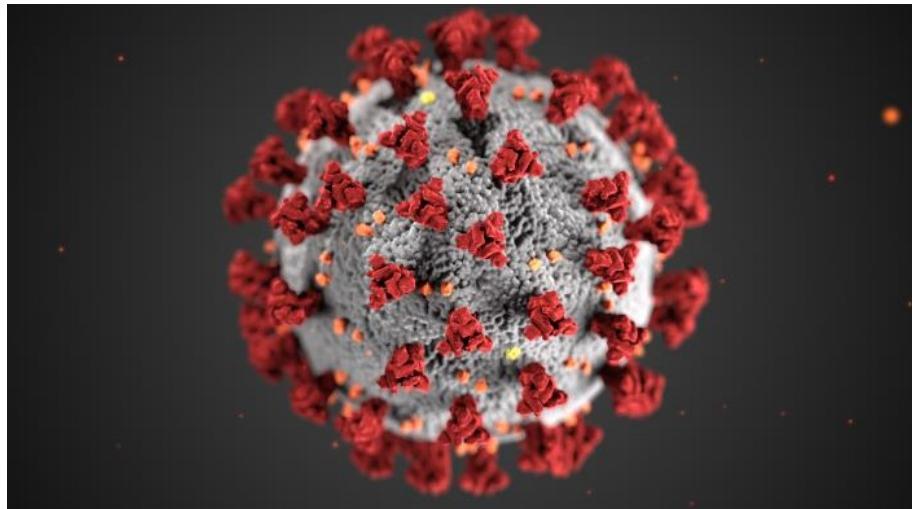
"Why many countries failed at COVID contact-tracing — but some got it right" ([Nature](#)).

Listen (25 mins): "Coronapod: The big COVID research papers of 2020" ([Nature](#); includes links to papers discussed).

A Thousand Words

"The best science images of 2020" ([Nature](#)).

The seventh crown. A coronavirus (artist's visualization) became 2020's biggest story as it caused a devastating pandemic. SARS-CoV-2 is the seventh coronavirus known to infect humans.



References

Statistics

JHU CSSE: Johns Hopkins Center for Systems Science and Engineering. Coronavirus COVID-19 Global Cases. Link: <https://coronavirus.jhu.edu/map.html>

VA DOH: Virginia Department of Health. COVID-19 in Virginia. Link: <http://www.vdh.virginia.gov/coronavirus/>

The Latest News on COVID-19 Vaccines

FDA: US Food & Drug Administration. FDA Briefing Document: Moderna COVID-19 Vaccine (17 December 2020). Link: <https://www.fda.gov/media/144434/download>

NPR: National Public Radio. Scott Hensley. FDA Panel Weighs Moderna's COVID-19 Vaccine (17 December 2020). Link: <https://www.npr.org/sections/health-shots/2020/12/17/947264730/fda-panel-weighs-modernas-covid-19-vaccine>

STAT: STATnews. FDA advisory panel endorses Moderna's Covid-19 vaccine, clearing way for authorization (15 December 2020). Link: <https://www.statnews.com/2020/12/17/moderna-vaccine-fda-panel/>

Other Things of Interest and Special Reports

BMJ: Update to living WHO guideline on drugs for covid-19. BMJ. 2020 Nov 19;371:m4475. doi: 10.1136/bmj.m4475. PMID: 33214213. Link: <https://www.bmjjournals.org/content/370/bmj.m3379>

NIH: National Institutes of Health. The COVID-19 Treatment Guidelines Panel's Statement on the Emergency Use Authorization of Baricitinib for the Treatment of COVID-19 (14 December 2020). Link: <https://www.covid19treatmentguidelines.nih.gov/statement-on-baricitinib-eua/>

Selected Literature: Peer-Reviewed Journals

BMJ: Xie Y, Bowe B, Maddukuri G, Al-Aly Z. Comparative evaluation of clinical manifestations and risk of death in patients admitted to hospital with covid-19 and seasonal influenza: cohort study. BMJ. 2020 Dec 15;371:m4677. doi: 10.1136/bmj.m4677. PMID: 33323357; PMCID: PMC7735416. Link: <https://www.bmjjournals.org/content/371/bmj.m4677>

Brain: Keddie S, Pakpoor J, Mousele C, Pipis M, Machado PM, Foster M, Record CJ, Keh RYS, Fehmi J, Paterson RW, Bharambe V, Clayton LM, Allen C, Price O, Wall J, Kiss-Csenki A, Rathnasabapathi DP, Geraldes R, Yermakova T, King-Robson J, Zosmer M, Rajakulendran S, Sumaria S, Farmer SF, Nortley R, Marshall CR, Newman EJ, Nirmalanathan N, Kumar G, Pinto AA, Holt J, Lavin TM, Brennan KM, Zandi MS, Jayaseelan DL, Pritchard J, Hadden RDM, Manji H, Willison HJ, Rinaldi S, Carr AS, Lunn MP. Epidemiological and cohort study finds no association between COVID-19 and Guillain-Barré syndrome. Brain. 2020 Dec 14:awaa433. doi: 10.1093/brain/awaa433. Epub ahead of print. PMID: 33313649. Link: <https://academic.oup.com/brain/advance-article/doi/10.1093/brain/awaa433/6031905>

Emerg Infect Dis: Heinrich F, Meißner K, Langenwalder F, Püschel K, Nörz D, Hoffmann A, et al. Postmortem stability of SARS-CoV-2 in nasopharyngeal mucosa. Emerg Infect Dis. 2021 Jan [published online 16 December 2020]. <https://doi.org/10.3201/eid2701.203112> Link: https://wwwnc.cdc.gov/eid/article/27/1/20-3112_article

Emerg Infect Dis: Jones JM, Kracalik I, Rana MM, Nguyen A, Keller BC, Mishkin A, et al. SARS-CoV-2 infections among recent organ recipients, March–May 2020, United States. *Emerg Infect Dis.* 2021 Feb [published online 16 December 2020]. <https://doi.org/10.3201/eid2702.204046> Link: https://wwwnc.cdc.gov/eid/article/27/2/20-4046_article

JAMA: Cance JD, Doyle E. Changes in Outpatient Buprenorphine Dispensing During the COVID-19 Pandemic. *JAMA.* 2020 Dec 15;324(23):2442-2444. doi: 10.1001/jama.2020.22154. PMID: 33320215. Link: <https://jamanetwork.com/journals/jama/fullarticle/2774040>

JAMA: Donnelly JP, Wang XQ, Iwashyna TJ, Prescott HC. Readmission and Death After Initial Hospital Discharge Among Patients With COVID-19 in a Large Multihospital System. *JAMA.* 2020 Dec 14:e2021465. doi: 10.1001/jama.2020.21465. Epub ahead of print. PMID: 33315057; PMCID: PMC7737131. Link: <https://jamanetwork.com/journals/jama/fullarticle/2774380>

JAMA: Faust JS, Krumholz HM, Du C, Mayes KD, Lin Z, Gilman C, Walensky RP. All-Cause Excess Mortality and COVID-19-Related Mortality Among US Adults Aged 25-44 Years, March-July 2020. *JAMA.* 2020 Dec 16. doi: 10.1001/jama.2020.24243. Epub ahead of print. PMID: 33325994. Link: <https://jamanetwork.com/journals/jama/fullarticle/2774445>

JAMA Intern Med: Link: Leventhal AM, Dai H, Barrington-Trimis JL, McConnell R, Unger JB, Sussman S, Cho J. Association of Political Party Affiliation With Physical Distancing Among Young Adults During the COVID-19 Pandemic. *JAMA Intern Med.* 2020 Dec 14. doi: 10.1001/jamainternmed.2020.6898. Epub ahead of print. PMID: 33315091. Link: <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2774123>

JAMA Netw Open: Madewell ZJ, Yang Y, Longini IM Jr, Halloran ME, Dean NE. Household Transmission of SARS-CoV-2: A Systematic Review and Meta-analysis. *JAMA Netw Open.* 2020 Dec 1;3(12):e2031756. doi: 10.1001/jamanetworkopen.2020.31756. PMID: 33315116. Link: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2774102>

JAMA Netw Open: Panetta L, Proulx C, Drouin O, Autmizguine J, Luu TM, Quach C, Kakkar F. Clinical Characteristics and Disease Severity Among Infants With SARS-CoV-2 Infection in Montreal, Quebec, Canada. *JAMA Netw Open.* 2020 Dec 1;3(12):e2030470. doi: 10.1001/jamanetworkopen.2020.30470. PMID: 33315110. Link: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2774096>

JAMA Netw Open: Wunsch H, Hill AD, Bosch N, Adhikari NKJ, Rubenfeld G, Walkey A, Ferreyro BL, Tillmann BW, Amaral ACKB, Scales DC, Fan E, Cuthbertson BH, Fowler RA. Comparison of 2 Triage Scoring Guidelines for Allocation of Mechanical Ventilators. *JAMA Netw Open.* 2020 Dec 1;3(12):e2029250. doi: 10.1001/jamanetworkopen.2020.29250. PMID: 33315112. Link: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2774098>

JAMA Otolaryngol Head Neck Surg: Kwak PE, Connors JR, Benedict PA, Timen MR, Wang B, Zhang Y, Youlios S, Sureau K, Persky MJ, Rafeq S, Angel L, Amin MR. Early Outcomes From Early

Tracheostomy for Patients With COVID-19. JAMA Otolaryngol Head Neck Surg. 2020 Dec 17. doi: 10.1001/jamaoto.2020.4837. Epub ahead of print. PMID: 33331855. Link: <https://jamanetwork.com/journals/jamaotolaryngology/fullarticle/2774263>

Lancet Child Adolesc Health: Lindan CE, Mankad K, et al. Neuroimaging manifestations in children with SARS-CoV-2 infection: a multinational, multicentre collaborative study. Lancet Child Adolesc Health. Published: December 15, 2020 DOI: [https://doi.org/10.1016/S2352-4642\(20\)30362-X](https://doi.org/10.1016/S2352-4642(20)30362-X) Link: [https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642\(20\)30362-X/fulltext](https://www.thelancet.com/journals/lanchi/article/PIIS2352-4642(20)30362-X/fulltext)

Lancet Digital Health: Morales DR, Conover MM, et al. Renin–angiotensin system blockers and susceptibility to COVID-19: an international, open science, cohort analysis. Lancet Digital Health. Published: December 17, 2020 DOI: [https://doi.org/10.1016/S2589-7500\(20\)30289-2](https://doi.org/10.1016/S2589-7500(20)30289-2) Link: [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(20\)30289-2/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(20)30289-2/fulltext)

Lancet Respir Med: Piroth L, Cottenet J, et al. Comparison of the characteristics, morbidity, and mortality of COVID-19 and seasonal influenza: a nationwide, population-based retrospective cohort study. Lancet Respir Med. Published: December 17, 2020 DOI: [https://doi.org/10.1016/S2213-2600\(20\)30527-0](https://doi.org/10.1016/S2213-2600(20)30527-0) Link: [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(20\)30527-0/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30527-0/fulltext)

MMWR: Demeke HB, Pao LZ, Clark H, et al. Telehealth Practice Among Health Centers During the COVID-19 Pandemic — United States, July 11–17, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1902–1905. DOI: <http://dx.doi.org/10.15585/mmwr.mm6950a4> Link: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6950a4.htm>

MMWR: Hobbs CV, Martin LM, Kim SS, et al. Factors Associated with Positive SARS-CoV-2 Test Results in Outpatient Health Facilities and Emergency Departments Among Children and Adolescents Aged <18 Years — Mississippi, September–November 2020. MMWR Morb Mortal Wkly Rep. ePub: 15 December 2020. DOI: <http://dx.doi.org/10.15585/mmwr.mm6950e3> Link: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6950e3.htm>

MMWR: Honein MA, Christie A, Rose DA, et al. Summary of Guidance for Public Health Strategies to Address High Levels of Community Transmission of SARS-CoV-2 and Related Deaths, December 2020. MMWR Morb Mortal Wkly Rep 2020;69:1860-1867. DOI: <http://dx.doi.org/10.15585/mmwr.mm6949e2> Link: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6949e2.htm>

MMWR: Romero L, Pao LZ, Clark H, et al. Health Center Testing for SARS-CoV-2 During the COVID-19 Pandemic — United States, June 5–October 2, 2020. MMWR Morb Mortal Wkly Rep 2020;69:1895–1901. DOI: <http://dx.doi.org/10.15585/mmwr.mm6950a3> Link: <https://www.cdc.gov/mmwr/volumes/69/wr/mm6950a3.htm>

Nature: Pairo-Castineira E, Clohisey S, Klaric L, Bretherick AD, Rawlik K, Pasko D, Walker S, Parkinson N, Fourman MH, Russell CD, Furniss J, Richmond A, Gountouna E, Wrobel N, Harrison D, Wang B, Wu Y, Meynert A, Griffiths F, Oosthuyzen W, Kousathanas A, Moutsianas L, Yang Z, Zhai R, Zheng C, Grimes G, Beale R, Millar J, Shih B, Keating S, Zechner M, Haley C, Porteous DJ, Hayward C, Yang J, Knight J, Summers C, Shankar-Hari M, Klenerman P, Turtle L, Ho A, Moore SC, Hinds C, Horby P, Nichol A, Maslove D, Ling L, McAuley D, Montgomery H, Walsh T, Pereira A, Renieri A; GenOMICC Investigators; ISARICC Investigators; COVID-19 Human Genetics Initiative; 23andMe Investigators; BRACOVID Investigators; Gen-COVID Investigators, Shen X, Ponting CP, Fawkes A, Tenesa A, Caulfield M, Scott R, Rowan K, Murphy L, Openshaw PJM, Semple MG, Law A, Vitart V, Wilson JF, Baillie JK. Genetic mechanisms of critical illness in Covid-19. *Nature*. 2020 Dec 11. doi: 10.1038/s41586-020-03065-y. Epub ahead of print. PMID: 33307546. Link: <https://www.nature.com/articles/s41586-020-03065-y>

NEJM: Kalil AC, Patterson TF, Mehta AK, Tomashek KM, Wolfe CR, Ghazaryan V, Marconi VC, Ruiz-Palacios GM, Hsieh L, Kline S, Tapson V, Iovine NM, Jain MK, Sweeney DA, El Sahly HM, Branche AR, Regalado Pineda J, Lye DC, Sandkovsky U, Luetkemeyer AF, Cohen SH, Finberg RW, Jackson PEH, Taiwo B, Paules CI, Arguinchona H, Goepfert P, Ahuja N, Frank M, Oh MD, Kim ES, Tan SY, Mularski RA, Nielsen H, Ponce PO, Taylor BS, Larson L, Rouphael NG, Saklawi Y, Cantos VD, Ko ER, Engemann JJ, Amin AN, Watanabe M, Billings J, Elie MC, Davey RT, Burgess TH, Ferreira J, Green M, Makowski M, Cardoso A, de Bono S, Bonnett T, Proshan M, Deye GA, Dempsey W, Nayak SU, Dodd LE, Beigel JH. Baricitinib plus Remdesivir for Hospitalized Adults with Covid-19. *N Engl J Med*. 2020 Dec 11. doi: 10.1056/NEJMoa2031994. Epub ahead of print. PMID: 33306283. Link: <https://www.nejm.org/doi/10.1056/NEJMoa2031994>

Selected Literature: Preprints

bioRxiv: Zhang L, Richards A, et al. SARS-CoV-2 RNA reverse-transcribed and integrated into the human genome (posted 13 December 2020). bioRxiv 2020.12.12.422516; doi: <https://doi.org/10.1101/2020.12.12.422516> Link: <https://www.biorxiv.org/content/10.1101/2020.12.12.422516v1>

News in Brief

Atlantic: The Atlantic. Ed Yong. How Science Beat the Virus (14 December 2020). Link: <https://www.theatlantic.com/magazine/archive/2021/01/science-covid-19-manhattan-project/617262>

BBC: BBC News. Helen Briggs. First case of coronavirus detected in wild animal (15 December 2020). Link: <https://www.bbc.com/news/science-environment-55309269>

BuzzFeed: BuzzFeed News. Amber Jamieson. This Is What It's Like To Be Part Of A COVID-19 Vaccine Trial (17 December 2020). Link:

<https://www.buzzfeednews.com/article/amberjamieson/astrazeneca-coronavirus-vaccine-trial-participant>

CBS: CBS News. Zoe Christen Jones. 2 Alaska health care workers have allergic reactions after taking Pfizer's COVID-19 vaccine (17 December 2020). Link:

<https://www.cbsnews.com/news/alaska-covid-vaccine-allergic-reaction-health-care-worker/>

CIGI: Centre for International Governance Innovation. On the Root Causes of Vaccine Hesitancy (10 December 2020). Link: <https://www.cigionline.org/big-tech/heidi-j-larson-root-causes-vaccine-hesitancy>

Health Affairs: Health Affairs blog. David E. Wennberg and Patrick J. Kennedy. Too Big To Ignore: 7 Recommendations To Address Our Growing Mental Health Crisis (14 December 2020). Link: <https://www.healthaffairs.org/do/10.1377/hblog20201210.312139/full/>

HPN: Homeland Preparedness News. Chris Galford. U.S. buys another 100 million doses of Moderna COVID-19 vaccine as emergency use authorizations roll out (14 December 2020). Link: <https://homelandprepnews.com/stories/58842-u-s-buys-another-100-million-doses-of-moderna-covid-19-vaccine-as-emergency-use-authorizations-roll-out/>

KFF: Kaiser Family Foundation. Jennifer Kates, Josh Michaud, and Jennifer Tolbert. How are States Prioritizing Who Will Get the COVID-19 Vaccine First? (14 December 2020). Link: <https://www.kff.org/policy-watch/how-are-states-prioritizing-who-will-get-the-covid-19-vaccine-first/>

Medpage: Medpage Today. Ricki Lewis. Are Old Vaccines Helpful Against COVID-19? (16 December 2020). Link: <https://www.medpagetoday.com/infectiousdisease/covid19/90266>

Nature: Nature. The best science images of 2020 (accessed 18 December 2020). Link: <https://www.nature.com/immersive/d41586-020-03436-5/index.html>

Nature: Nature Podcast. Coronapod: The big COVID research papers of 2020 (17 December 2020). Link: <https://www.nature.com/articles/d41586-020-03609-2>

Nature: Nature. Nicola Jones. How COVID-19 is changing the cold and flu season (15 December 2020). Link: <https://www.nature.com/articles/d41586-020-03519-3>

Nature: Nature. Dyani Lewis. Why many countries failed at COVID contact-tracing — but some got it right (14 December 2020; updated 17 December 2020). Link: <https://www.nature.com/articles/d41586-020-03518-4>

Novartis: Novartis. Novartis provides update on RUXCOVID study of ruxolitinib for hospitalized patients with COVID-19 (14 December 2020). Link: <https://www.novartis.com/news/media-releases/novartis-provides-update-ruxcovid-study-ruxolitinib-hospitalized-patients-covid-19>

NPR: National Public Radio. Jaclyn Diaz. U.S. Surpasses 3,600 Daily Coronavirus Deaths, Breaks Prior Hospitalization Record (17 December 2020). Link:

<https://www.npr.org/sections/coronavirus-live-updates/2020/12/17/947417443/u-s-surpasses-3-600-coronavirus-deaths-breaks-prior-hospitalization-record>

NPR: National Public Radio. Sarah McCammon. 'What Real Friends Do': How to Navigate Tough Conversations About COVID-19 (16 December 2020). Link:

<https://www.npr.org/2020/12/16/947143343/what-real-friends-do-how-to-navigate-tough-conversations-about-covid-19>

NYT: New York Times. Michael Wines and Amy Harmon. What Happens When a Superspread Event Keeps Spreading (11 December 2020). Link:

<https://www.nytimes.com/2020/12/11/us/biogen-conference-covid-spread.html>

RECOVERY: Statement from the Chief Investigators of the Randomised Evaluation of COVid-19 thERapY (RECOVERY) Trial on azithromycin (14 December 2020). Link:

<https://www.recoverytrial.net/news/recovery-trial-finds-no-benefit-from-azithromycin-in-patients-hospitalised-with-covid-19>

Reuters: Reuters. Andreas Rinke, Ludwig Burger, Francesco Guarascio. Europe set to approve COVID-19 vaccine in Christmas week (15 December 2020). Link:

<https://www.reuters.com/article/health-coronavirus-vaccine-ema/update-4-europe-set-to-approve-covid-19-vaccine-in-christmas-week-idUSL8N2IV2H3>

STAT: STATnews. Erin Brodwin. Early data suggest wearables can catch some cases of Covid-19 before symptoms emerge (14 December 2020). Link:

<https://www.statnews.com/2020/12/14/oura-apple-watch-covid-wearables/>

STAT: STATnews. Andrew Joseph. The coronavirus at 1: A year into the pandemic, what scientists know about how it spreads, infects, and sickens (14 December 2020). Link:

<https://www.statnews.com/2020/12/14/portrait-of-the-coronavirus-at-1/>

USDA: US Department of Agriculture. Confirmation of COVID-19 in a Snow Leopard at a Kentucky Zoo (11 December 2020). Link:

https://www.aphis.usda.gov/aphis/newsroom/stakeholder-info/sa_by_date/sa-2020/sa-12/ky-snow-leopard-covid

WaPo: Washington Post. Allyson Chiu. For many with eating disorders, pandemic set off 'cascade of problems.' Here's how to get help (14 December 2020). Link:

https://www.washingtonpost.com/lifestyle/wellness/eating-disorders-help-covid/2020/12/11/7c201cc8-3aed-11eb-9276-ae0ca72729be_story.html

WaPo: Washington Post. Jennifer Davis. Covid Christmas: Managing kids' expectations without turning into the Grinch (14 December 2020). Link:

https://www.washingtonpost.com/lifestyle/on-parenting/christmas-pandemic-parenting-kids-expectations/2020/12/11/c53c747c-34b4-11eb-a997-1f4c53d2a747_story.html

WaPo: Washington Post. Heather Long. Nearly 8 million Americans have fallen into poverty since the summer (16 December 2020). Link:

<https://www.washingtonpost.com/business/2020/12/16/poverty-rising/>